

**CALCULATING COST DISCOUNTS FOR MOBILE PHONE INTERNET
ACCESS**

5 **BACKGROUND OF THE INVENTION**

1. Technical Field:

The present invention relates generally to computer network environments, and more specifically to mobile
10 phone access via the Internet of electronic commerce sites.

2. Description of Related Art:

Internet shopping via web-based cellular phone is
15 not picking up very rapidly in the United States, primarily because of the high cost per minute Web access. Internet access via mobile phone adds costs to Web access that are normally not encountered with land line access. These additional costs provide a significant disincentive
20 to use mobile phones for Internet shopping, by adding to the costs of purchases.

Some telecommunication plans do allow free web access over cellular phones to selected merchants (from whom telecommunication companies receives payment).
25 However, the free web access is not extended to all merchants.

Currently, Internet merchants have to subscribe to discount plans offered by telecommunications carriers. These plans often allow cellular phone users to access
30 the merchant sites for free. Cellular phone users might rely on a bookmark listing such discount/free merchant sites. However, the high costs of such special

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arrangements with the telecommunications carriers are only affordable to large, well-established Internet businesses.

Therefore, an affordable and flexible discount
5 method for defraying the costs of cellular phone Internet shopping would be desirable.

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SUMMARY OF THE INVENTION

5 The present invention provides a method, program and
system for calculating a cost discount for mobile
telephone Internet access. The invention comprises
receiving an access request from a customer using a
mobile phone and determining that the phone is using a
10 wireless communication protocol. An electronic document
is sent back to the mobile phone. The session time is
tracked, and if a customer purchase order is received, a
discount is applied to the purchase price of the order.

BRIEF DESCRIPTION OF THE DRAWINGS

The novel features believed characteristic of the invention are set forth in the appended claims. The invention itself, however, as well as a preferred mode of use, further objectives and advantages thereof, will best be understood by reference to the following detailed description of an illustrative embodiment when read in conjunction with the accompanying drawings, wherein:

10 **Figure 1** depicts a pictorial representation of a network of data processing systems in which the present invention may be implemented;

15 **Figure 2** depicts a block diagram of a data processing system that may be implemented as a server in accordance with a preferred embodiment of the present invention;

Figure 3A depicts a diagram illustrating a mobile phone in accordance with a preferred embodiment of the present invention;

20 **Figure 3B** depicts a block diagram illustrating the hardware configuration of a mobile phone in accordance with a preferred embodiment of the present invention;

Figure 4 depicts a flowchart illustrating an application of a cellular phone discount in accordance with the present invention;

25 **Figure 5** depicts a flowchart illustrating the overall process flow of a cell phone discount by the merchant server in accordance with the present invention;

30 **Figure 6** depicts a diagram illustrating a discount computation mechanism in accordance with the present invention;

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Figure 7 depicts a diagram illustrating the software structure of a merchant server in accordance with the present invention; and

Figure 8 depicts a pictorial diagram illustrating
5 phone displays for discount information in accordance
with the present invention.

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DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

With reference now to the figures, **Figure 1** depicts a pictorial representation of a network of data processing systems in which the present invention may be implemented. Network data processing system **100** is a network of computers in which the present invention may be implemented. Network data processing system **100** contains a network **102**, which is the medium used to provide communications links between various devices and computers connected together within network data processing system **100**. Network **102** may include several types of connections, such as wire, wireless communication links, or fiber optic cables. However, for the purposes of the present invention, wireless communication links will be emphasized.

In the depicted example, server **104**, **106**, and **108** are connected to network **102**. In the depicted example, servers **104** and **106** are merchant servers with high speed connections to network **102**, while server **108** is a telecommunications/gateway server. In addition, clients **110**, **112** and **114** also are connected to network **102**. Client **110** is a personal computer using a conventional land line communication link. Clients **112** and **114** are mobile phones relying on wireless communication links. Clients **110**, **112**, and **114** are clients to servers **104**, **106**, and **108**. Network data processing system **100** may include additional servers, clients, and other devices not shown.

In the depicted example, network data processing system **100** is the Internet with network **102** representing a worldwide collection of networks and gateways that use the

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TCP/IP suite of protocols to communicate with one another. At the heart of the Internet is a backbone of high-speed data communication lines between major nodes or host computers, consisting of thousands of commercial, government, educational and other computer systems that route data and messages. **Figure 1** is intended as an example, and not as an architectural limitation for the present invention.

Referring to **Figure 2**, a block diagram of a data processing system that may be implemented as a server is depicted in accordance with a preferred embodiment of the present invention. Data processing system **200** may be a symmetric multiprocessor (SMP) system including a plurality of processors **202** and **204** connected to system bus **206**. Alternatively, a single processor system may be employed. Also connected to system bus **206** is memory controller/cache **208**, which provides an interface to local memory **209**. I/O bus bridge **210** is connected to system bus **206** and provides an interface to I/O bus **212**. Memory controller/cache **208** and I/O bus bridge **210** may be integrated as depicted.

Peripheral component interconnect (PCI) bus bridge **214** connected to I/O bus **212** provides an interface to PCI local bus **216**. A number of modems may be connected to PCI bus **216**. Typical PCI bus implementations will support four PCI expansion slots or add-in connectors. Communications links to clients **110-114** in **Figure 1** may be provided through modem **218** and network adapter **220** connected to PCI local bus **216** through add-in boards.

Additional PCI bus bridges **222** and **224** provide interfaces for additional PCI buses **226** and **228**, from

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which additional modems or network adapters may be supported. In this manner, data processing system **200** allows connections to multiple network computers. A memory-mapped graphics adapter **230** and hard disk **232** may
5 also be connected to I/O bus **212** as depicted, either directly or indirectly.

Those of ordinary skill in the art will appreciate that the hardware depicted in **Figure 2** may vary. For example, other peripheral devices, such as optical disk
10 drives and the like, also may be used in addition to or in place of the hardware depicted. The depicted example is not meant to imply architectural limitations with respect to the present invention.

The data processing system depicted in **Figure 2** may
15 be, for example, an eServer pSeries system, a product of International Business Machines Corporation in Armonk, New York, running the Advanced Interactive Executive (AIX) or Linux operating systems.

With reference now to **Figure 3A**, a diagram
20 illustrating a mobile phone is depicted in accordance with a preferred embodiment of the present invention. Mobile phone **300** includes a display **306** for presenting textual and graphical information. Display **306** may be a known display device, such as a liquid crystal display
25 (LCD) device.

Mobile phone **300** may also include keypad **308**,
speaker **314**, and microphone **316**. The keypad may be used to enter, for example, telephone numbers, user identification information, and commands for interacting
30 with the interface. Audio feedback may be presented via speaker **314**. In addition to normal voice conversation, feedback may include other information, for example,

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location. Microphone **316** can be used not only for voice conversation, but for entering specific voice commands for voice actuated functions.

Mobile phone **300** also includes antenna **318**, which is
5 necessary for establishing wireless communication links with remote transmitting towers.

Turning now to **Figure 3B**, a block diagram illustrating the hardware configuration of mobile phone **300** is shown in accordance with a preferred embodiment of
10 the present invention. Figure **3B** illustrates the increasing sophistication of modern mobile phone designs.

Mobile phone **300** employs bus architecture. Processor **322** and main memory **324** are connected to bus **330**. Display adapter **326**, keypad adapter **328**, storage **332**, and audio
15 adapter **334** are also connected to bus **330**. Mobile phone **300** also includes wireless link **336** connected to bus **330**. Those of ordinary skill in the art will appreciate that the hardware in **Figure 3B** may vary depending on the implementation. Other internal hardware or peripheral
20 devices may be used in addition to or in place of the hardware depicted in **Figure 3B**.

Mobile phone **300** may rely on Wireless Application Protocol (WAP) for facilitating communications. WAP is a standard for providing wireless phones, pagers and other
25 handheld devices with secure access to e-mail and text-based Web pages. WAP provides a complete environment for wireless applications that includes a wireless counterpart of TCP/IP and a framework for telephony integration such as call control and phone book
30 access. WAP features the Wireless Markup Language (WML), which was derived from Phone.com's Handheld Device Markup

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Language (HDML) and is a streamlined version of HTML for small screen displays. It also uses WMLScript, a compact JavaScript-like language that runs in limited memory. WAP also supports handheld input methods such as a keypad and voice recognition. Independent of the air interface, WAP runs over all the major wireless networks in place. It is also device independent, requiring only a minimum functionality in the unit so that it can be used with a myriad of phones and handheld devices. However, it should be pointed out that WAP has been described for illustrative purposes, and other wireless protocols may be used to implement the present invention.

The depicted example in **Figure 3B** and examples described above are not meant to imply architectural limitations. In addition, the use of wireless communications protocols for Internet access need not be restricted to mobile phones. The present invention may be applied to other wireless devices which have similar communications protocols. Mobile phones are used merely for illustrative purposes.

The present invention provides a method for Internet merchants to apply discounts to cellular phone purchases. While prior art approaches rely on merchants subscribing to a discount plan offered by a telecommunications supplier, the present invention allows the merchant to offer discounts directly to the customer. This direct approach not only provides greater flexibility than subscribing to a centralized discount plan, but also opens opportunities for Internet merchants that might not otherwise be able to afford subscribing with the major telecommunications companies.

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Referring to **Figure 4**, a flowchart illustrating an application of a cellular phone discount is depicted in accordance with the present invention. The customer registers with an Internet merchant (step **401**). Session
5 identifiers may be used to track the customer (i.e. IDs embedded in cookies or Universal Resource Locator (URL) encoding). First time customer who have not registered with a merchant may be alerted by the merchant server that a discount may be applied to any purchases, which
10 will provide further incentive for first time wireless customers who may not otherwise be aware of the potential savings. An email may also be sent to customers alerting them about possible discounts.

The merchant server determines that the customer's
15 client (e.g. cell phone) is communicating over the WAP protocol (wireless communications)(step **402**). This may be accomplished by detecting the type of browse used by the mobile phone, the type of header, or the presence of a WAP gateway. The merchant server then returns WML and
20 also tracks the time the client spends at the web site (step **403**). To reduce costs to consumers, and thereby encourage more cell phone web purchases, the time spent at a merchant's web site can be used to calculate discounts applied to purchases. In addition to
25 time-based discounts, other discounting methods may be used to cover cellular phone costs. Examples of alternate discounts schemes include fixed rate per call and percentage of purchase price. Some merchants may wish to apply a ceiling to the discount. In addition,
30 because different wireless communication plans may have different costs, greater discounts may be applied to higher priced plans. Examples of ways to determine the

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particular plan used by a customer (and hence relative costs) include: detecting the particular WAP gateway being used, the customer's wireless service provider, and customer profiles. Many other discount schemes are possible and should be determined according to merchant business needs.

When and if the customer makes a purchase from the merchant, a discount is applied directly to the purchase price, depending on the cost determination and discount method of the merchant (step **404**). The system then determines if there are more requests from the same customer (step **405**). An example would be a "continue shopping" command from the customer after placing the order. If there is another request, the system returns to step **403**. If there are no more requests from the customer, the process stops and the system exits.

Turning to **Figure 5**, a flowchart illustrating the overall process flow of a cell phone discount by the merchant server is depicted in accordance with the present invention. Customers register with a merchant database (step **501**). This database is maintained on the merchant server and contains different types of registered customers. The criteria for classifying customers is determined by the business requirements of the merchant. For example, merchants may classify customers as business or professional customers, or they may classify customers according to the customer's wireless communication plan. Merchants might also classify customers according to the types of products the customers are interested in purchasing. These kinds of details can be gathered from the customers during the registration process in step **501**, and may also be updated

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at a later date. In addition, the server might track repeat customers and apply greater discounts to regular customers, depending upon the customers' purchase histories.

5 When a customer contacts the merchant server or places an order (step **502**), the merchant server maps the customer to a discount scheme table (step **503**), depending on the customer's classification within the database. The discount scheme table may contain several discounting
10 methods, similar to those described above. The different schemes may be applied to different customer classifications. Alternatively, the server may calculate which discount scheme will produce the greatest savings for the customer for a particular transaction.

15 After the customer/order is mapped to a particular discount scheme, the server uses the scheme to compute the discount for the transaction (step **504**) and then applies the discount when calculating the customer's bill (step **505**), as illustrated below in **Figure 6**.

20 Referring to **Figure 6**, a diagram illustrating a discount computation mechanism is depicted in accordance with the present invention. The example in **Figure 6** illustrates a time-based discount scheme. However, as stated above, other discount schemes may be used. The
25 computation mechanism identifies a particular customer with the session and transaction. In the present example, the session identifier is 1A36794 (which is in the cookie). Because the present example is using a time-based discount scheme, the computation mechanism
30 uses the total session time recorded by the server (45 minutes). The session time is then multiplied by a cost conversion factor (10¢ per minute), and the total

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discount (\$4.50) is calculated and applied to the purchase price.

The discount schemes used by merchants might require a minimum total purchase, in order to make the discount services more cost effective for the merchants.

Referring to **Figure 7**, a diagram illustrating the software structure of a merchant server is depicted in accordance with the present invention. This diagram is an example of the types of software features used to carry out the method of the present invention. The merchant server contains Web Server software **701**, which enables the server to communicate with other servers and client machines. Incoming requests coming through the Web Server software **701** are compared to a database **702** of types of customers. These types might include first time customers, repeat customers with registered accounts, business customers, or any type of classification that the merchant wishes to use, based on the nature of the merchant's business. The classification of customers may also be based on method of communication used by the customer in contacting the merchant. The explanation of the present invention assumes that the customer is using mobile or cellular telephone communication. However, there may also be possible sub-classifications with mobile communications.

The classification of the incoming customer request is then mapped to a table of discount schemes **703**. Discount computation software **704** then calculates the discount based on the appropriate discount scheme. This discount is then applied to the purchase price by billing software **705**.

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Referring now to **Figure 8**, a pictorial diagram illustrating phone displays for discount information is depicted in accordance with the present invention. The displays illustrated in **Figure 8** are merely possible
5 examples of the type of discount display a customer might receive on his or her cell phone after an order is placed. Display **800** is an example of a detailed display identifying the merchant, the discount parameter (i.e. time), and the total discount on the order. In the
10 example illustrated by display **810**, a menu selection option is presented to the customer rather than detailed information.

Because wireless Internet purchases may be impulse and discretionary, an Internet merchant that discounts
15 the cost of cell-phone access may find more visitors and recoup the cost of the discounts due to economies of scale from greater sales. By using the present invention, merchants will not have to pay the telecommunications carriers in order to provide free
20 cell-phone access to the merchant web sites. This allows smaller merchants to avoid the often prohibitive costs of making special arrangements with the telecommunications firms.

It is important to note that while the present
25 invention has been described in the context of a fully functioning data processing system, those of ordinary skill in the art will appreciate that the processes of the present invention are capable of being distributed in the form of a computer readable medium of instructions
30 and a variety of forms and that the present invention applies equally regardless of the particular type of signal bearing media actually used to carry out the

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distribution. Examples of computer readable media include recordable-type media, such as a floppy disk, a hard disk drive, a RAM, CD-ROMs, DVD-ROMs, and transmission-type media, such as digital and analog
5 communications links, wired or wireless communications links using transmission forms, such as, for example, radio frequency and light wave transmissions. The computer readable media may take the form of coded formats that are decoded for actual use in a particular
10 data processing system. WAP and WML are used merely for illustrative purposes. Other markup languages (e.g. HDML) and communications protocols (e.g. bluetooth) may be used with the present invention.

The description of the present invention has been
15 presented for purposes of illustration and description, and is not intended to be exhaustive or limited to the invention in the form disclosed. Many modifications and variations will be apparent to those of ordinary skill in the art. The embodiment was chosen and described in
20 order to best explain the principles of the invention, the practical application, and to enable others of ordinary skill in the art to understand the invention for various embodiments with various modifications as are suited to the particular use contemplated.